Complete Summary

GUIDELINE TITLE

Practice parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology and the American Epilepsy Society.

BIBLIOGRAPHIC SOURCE(S)

Krumholz A, Wiebe S, Gronseth G, Shinnar S, Levisohn P, Ting T, Hopp J, Shafer P, Morris H, Seiden L, Barkley G, French J, Quality Standards Subcommittee of the American Academy of Neurology, American Epilepsy Society. Practice Parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology and the American Epilepsy Society. Neurology 2007 Nov 20;69(21):1996-2007. [90 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Unprovoked first seizure

Note: First seizure is defined as to include a single seizure or multiple seizures within 24 hours with recovery of consciousness between the seizures.

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Risk Assessment
Screening

CLINICAL SPECIALTY

Emergency Medicine
Internal Medicine
Neurological Surgery
Neurology
Radiology

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Patients
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To assess the yield and value of various diagnostic procedures such as electroencephalography (EEG), computed tomography (CT), or magnetic resonance imaging (MRI), and specific laboratory or diagnostic tests, including blood counts, blood glucose, electrolytes, lumbar puncture, and toxicology screening
- To develop practice parameters for patient care that are based on analysis of evidence

TARGET POPULATION

Adults (individuals over 18 years of age) presenting with an apparent unprovoked first seizure

Note: This guideline excludes patients who have been diagnosed with epilepsy (defined as recurrent [two or more] unprovoked seizures) at the time of initial presentation. Also excluded were adults presenting with a seizure as a known consequence of an acute condition such as immediate cerebral trauma or stroke. In addition, only patients who had returned to their normal baseline level of function were considered in order to avoid including patients with an acute symptomatic or provoked seizure.

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation/Screening

Assessment of the need to routinely include the following neurodiagnostic and other tests in the evaluation of patients presenting with unprovoked first seizure:

- Electroencephalogram
- Computed tomography
- Magnetic resonance imaging
- Blood counts, blood glucose, electrolyte panels
- Toxicologic screening
- Lumbar puncture

MAJOR OUTCOMES CONSIDERED

- Neurological abnormalities
- Hospital admission
- Seizure recurrence
- Diagnosis of brain disorders such as brain tumor, stroke, cysticercosis, or other structural lesions
- Cost

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A literature search was conducted by the University of Minnesota using methodology and filters that increase the yield of evidence-based articles. The search used MedLine, 1966 to November 2004, and also included CINAHL and The Cochrane Trials Register.

All citations and abstracts were printed and screened by two reviewers for any mention of patients with a first seizure, a first presentation, or a new diagnosis of seizure or epilepsy using established criteria (see Appendix 5 in the original guideline document). To be included in the review, studies had to report results of any diagnostic or monitoring intervention pertinent to a first or new seizure in adults or adolescents (>18 years of age), with at least 10 patients as total sample size. Studies with mixed age populations were reviewed for data pertaining to patients >18 years of age when possible.

The search identified 793 articles, all obtained in abstract form. Each abstract was reviewed by two committee members. The authors identified 157 articles for review of the full text article (an article was included for review if selected by at least one committee member based on exclusion/inclusion criteria in appendix 4 [see original guideline document]).

The 157 full text articles were obtained and reviewed by two committee members using established criteria. Articles were accepted or rejected when agreed on by

both reviewers using inclusion and exclusion criteria in appendix 4 (see the original guideline document). When there was disagreement between the reviewers, a third reviewer cast the determining vote. There were 10 instances of disagreement, resolved by a third party. Of the 157 articles reviewed, 39 were selected as acceptable. An additional 33 studies from the same time period were identified from review articles and other sources; these were subjected to the same process and 14 were selected for inclusion.

NUMBER OF SOURCE DOCUMENTS

53

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

AAN Classification of Evidence for Rating of Screening Articles

Class I: A statistical, population-based sample of patients studied at a uniform point in time (usually early) during the course of the condition. All patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations.

Class II: A statistical, non-referral-clinic-based sample of patients studied at a uniform point in time (usually early) during the course of the condition. Most patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation that is masked to the patients' clinical presentations.

Class III: A sample of patients studied during the course of the condition. Some patients undergo the intervention of interest. The outcome, if not objective, is determined in an evaluation by someone other than the treating physician.

Class IV: Expert opinion, case reports, or any study not meeting criteria for Class I to III.

METHODS USED TO ANALYZE THE EVIDENCE

Meta-Analysis of Randomized Controlled Trials
Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Each accepted study was abstracted by one investigator and agreed to by a second. Key data elements sought for extraction from each study included study, patient, and intervention characteristics. In addition, for all diagnostic tests, sensitivity, specificity, and positive and negative predictive value, with its gold standard, were sought. All eligible articles were scored on features pertinent to

study design, execution, and reporting, with a range of possible scores as standardized by the American Academy of Neurology (AAN) Quality Standards Subcommittee.

In order to score the evidence we used the Method of Screening Intervention and Prognosis approved by the Quality Standards Subcommittee (QSS) of the AAN (see "Rating Scheme for the Strength of the Evidence" and "Rating Scheme for the Strength of the Recommendations.") Of the 53 articles, one was ranked as Class I, 11 as Class II, and the remaining 41 as Class III or IV.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Other

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Conclusions and recommendations were made according to the American Academy of Neurology (AAN) criteria for translating the quality of screening and diagnostic evidence to recommendations.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Classification of Recommendations

A = Established as effective, ineffective, or harmful (or established as useful/predictive or not useful/predictive) for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.*)

B = Probably effective, ineffective, or harmful (or probably useful/predictive or not useful/ predictive) for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent Class II studies.)

C = Possibly effective, ineffective, or harmful (or possibly useful/predictive or not useful/ predictive) for the given condition in the specified population. (Level C rating requires at least one Class II study or two consistent Class III studies.)

U = Data inadequate or conflicting; given current knowledge, treatment (test, predictor) is unproven. (Studies not meeting criteria for Class I–Class III).

*In exceptional cases, one convincing Class I study may suffice for an "A" recommendation if 1) all criteria are met, 2) the magnitude of effect is large (relative rate improved outcome >5 and the lower limit of the confidence interval is >2).

COST ANALYSIS

One major study estimates the annual cost of epilepsy in the United States at $12.5 billion in 1995, with the majority of direct cost attributed to diagnostic tests, medical care, and drugs prescribed at the time of the initial evaluation for a seizure disorder or epilepsy. Misdiagnosis may lead to ineffective management

choices and excessive and unnecessary costs. Errors are not only expensive but may also result in harm to the patient.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline was approved by the Quality Standards Subcommittee on October 28, 2006; by the Practice Committee on July 16, 2007; and by the American Academy of Neurology (AAN) Board of Directors on July 19, 2007.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions of the strength of the recommendations (A, B, C, U) and classification of the evidence (Class I through Class IV) are provided at the end of the "Major Recommendations" field.

Electroencephalography (EEG)

Should an EEG be routinely ordered in an adult presenting with an apparent unprovoked first seizure?

Conclusion

For adults presenting with an apparent unprovoked first seizure, analysis of the evidence from 1 Class I and 10 Class II studies indicates that the EEG is probably helpful. It has a substantial yield with about 29% of EEGs demonstrating significant abnormalities, and these abnormalities predict the risk for seizure recurrence. In addition, EEG is regarded as a standard for the initial classification of seizures since it forms a basis for the "clinical and electroencephalographic classification of epileptic seizures."

Recommendations

1. The EEG (routine) should be considered as part of the neurodiagnostic evaluation of the adult with an apparent unprovoked first seizure because it has a substantial yield (**Level B**).
2. The EEG (routine) should be considered as part of the neurodiagnostic evaluation of the adult with an apparent unprovoked first seizure because it has value in determining the risk for seizure recurrence (**Level B**).

Neuroimaging Studies

Should a brain imaging study (computed tomography [CT] or magnetic resonance imaging [MR]) be routinely ordered in an adult presenting with an apparent unprovoked first seizure?

Conclusion

For adults presenting initially with an apparent unprovoked first seizure, the evidence from seven Class II studies indicates that a brain imaging study, either a CT or MRI, is probably useful. It has a significant yield of about 10%, which may lead to the diagnosis of disorders such as a brain tumor, stroke, cysticercosis, or other structural lesions, and may have some value in determining the risk for seizure recurrence.

Recommendation

Brain imaging using CT or MRI should be considered as part of the neurodiagnostic evaluation of adults presenting with an apparent unprovoked first seizure (**Level B**).

Laboratory Studies

Should blood counts, blood glucose, and electrolyte panels be routinely ordered in an adult with an apparent unprovoked first seizure?

Conclusion

Data from two Class II and four Class III studies showed that in adults presenting with an apparent unprovoked first seizure, although some abnormal laboratory results are reported, there is not sufficient evidence to support or refute recommending routine testing of blood glucose, blood counts, or electrolyte panels. The necessity for such studies should be guided by specific clinical circumstances based on the history, physical, and neurologic examination.

Recommendation

In the adult initially presenting with an apparent unprovoked first seizure, blood glucose, blood counts, and electrolyte panels (particularly sodium) may be helpful in specific clinical circumstances, but there are insufficient data to support or refute routine recommendation of any of these laboratory tests (**Level U**).

Should a lumbar puncture be routinely performed in an adult presenting with an apparent unprovoked first seizure?

Conclusion

Data from two Class III studies revealed significant abnormalities in up to 8% of a mixed group of patients presenting to an emergency department with a first seizure. However, the studies selectively performed lumbar punctures based on clinical findings and included patients who did not meet our inclusion criteria, such as those with acute symptomatic causes for their seizures or who had not returned to their normal baseline function.

Recommendation

In the adult initially presenting with an apparent unprovoked first seizure, lumbar puncture may be helpful in specific clinical circumstances, such as patients who are febrile, but there are insufficient data to support or refute recommending routine lumbar puncture (**Level U**).

Should toxicologic screening be routinely ordered in an adult presenting with an apparent unprovoked first seizure?

Conclusion

In two Class III studies considering the value of toxicology screening in adult patients presenting with a seizure, some patients with apparent unprovoked first seizure were included, but neither study investigated the use of routine toxicology screening for such patients.

Recommendation

In the adult presenting with an apparent unprovoked seizure, toxicology screening may be helpful in specific clinical circumstances, but there are insufficient data to support or refute a routine recommendation for toxicology screening (**Level U**).

Definitions:

AAN Classification of Evidence for Rating of Screening Articles

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Classification of Recommendations

A = Established as effective, ineffective, or harmful (or established as useful/predictive or not useful/predictive) for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.*)

B = Probably effective, ineffective, or harmful (or probably useful/predictive or not useful/ predictive) for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent Class II studies.)

C = Possibly effective, ineffective, or harmful (or possibly useful/predictive or not useful/ predictive) for the given condition in the specified population. (Level C rating requires at least one Class II study or two consistent Class III studies.)

U = Data inadequate or conflicting; given current knowledge, treatment (test, predictor) is unproven. (Studies not meeting criteria for Class I–Class III).

*In exceptional cases, one convincing Class I study may suffice for an "A" recommendation if 1) all criteria are met, 2) the magnitude of effect is large (relative rate improved outcome >5 and the lower limit of the confidence interval is >2).

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate diagnosis and management of adult patients with apparent unprovoked first seizure

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This statement is provided as an educational service of the American Academy of Neurology (AAN). It is based on an assessment of current scientific and clinical information. It is not intended to include all possible proper methods of care for a particular neurologic problem or all legitimate criteria for choosing to use a specific procedure. Neither is it intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and physician caring for the patient, based on all of the circumstances involved.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Quick Reference Guides/Physician Guides
Resources
Staff Training/Competency Material
Wall Poster

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Krumholz A, Wiebe S, Gronseth G, Shinnar S, Levisohn P, Ting T, Hopp J, Shafer P, Morris H, Seiden L, Barkley G, French J, Quality Standards Subcommittee of the American Academy of Neurology, American Epilepsy Society. Practice Parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology and the American Epilepsy Society. Neurology 2007 Nov 20;69(21):1996-2007. [90 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2007 Nov 20

GUIDELINE DEVELOPER(S)

American Academy of Neurology - Medical Specialty Society
American Epilepsy Society - Disease Specific Society

SOURCE(S) OF FUNDING

American Academy of Neurology (AAN)

GUIDELINE COMMITTEE

Quality Standards Subcommittee

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The American Academy of Neurology (AAN) is committed to producing independent, critical, and truthful clinical practice guidelines (CPGs). Significant efforts are made to minimize the potential for conflicts of interest to influence the recommendations of this CPG. To the extent possible, the AAN keeps separate those who have a financial stake in the success or failure of the products appraised in the CPGs and the developers of the guidelines. Conflict of interest forms were obtained from all authors and reviewed by an oversight committee prior to project initiation. AAN limits the participation of authors with substantial conflicts of interest. The AAN forbids commercial participation in, or funding of, guideline projects. Drafts of the guidelines have been reviewed by at least three AAN committees, a network of neurologists, *Neurology*® peer reviewers, and representatives from related fields. The AAN Guideline Author Conflict of Interest Policy can be viewed at www.aan.com.

The authors report no conflicts of interest.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: A list of American Academy of Neurology (AAN) guidelines, along with a link to a Portable Document Format (PDF) file for this guideline, is available at the AAN Web site.

Print copies: Available from the AAN Member Services Center, (800) 879-1960, or from AAN, 1080 Montreal Avenue, St. Paul, MN 55116.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- AAN guideline development process [online]. St. Paul (MN): American Academy of Neurology. Available from the American Academy of Neurology Web site.
- Evaluating an apparent unprovoked first seizure in adults. AAN summary of evidence-based guidelines for clinicians. St. Paul (MN): American Academy of Neurology. 2007. 2 p. Available in Portable Document Format (PDF) from the AAN Web site.
- Case study and coding. Practice parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review). St. Paul (MN): American Academy of Neurology. 2007. 4 p. Available in Portable Document Format (PDF) from the AAN Web site.
- Poster. Practice parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review). St. Paul (MN): American Academy of Neurology. 2007. 1 p. Available in Portable Document Format (PDF) from the AAN Web site.
- Evaluating an apparent unprovoked first seizure in adults. AAN guideline podcast. St. Paul (MN): American Academy of Neurology. Available from the AAN Web site.

PATIENT RESOURCES

The following is available:

- Evaluating an apparent unprovoked first seizure in adults. AAN guideline summary for patients and their families. St. Paul (MN): American Academy of Neurology (AAN). 2 p.

Electronic copies: Available in Portable Document Format (PDF) from the AAN Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

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